PLAINTIFF'S EXHIBIT

GP-1298

PRODUCT DEVELOPMENT & TECHNICAL SERVICES

SIX MONTH REPORT

July through December 1972

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SIX MONTH SUMMARY

This report covers the activities of the Product Development and Technical Service Department during the past six months. Our identification has been changed to be more appropriate since we absorbed some of the functions of the old Technical Service Department. The report is divided into five sections describing each activity; i.e., product development, manufacturing services, marketing services, industry representation, and patents & licensing.

Our investment in product development and technical service in 1972 was $303,762. The distribution of expenses is shown on page 3. New products developed during the past five years added nearly $3 million to sales and nearly $0.75 million to the division profits in 1972. The figures for the last six months are shown on page 2. A recent project which is beginning to pay off is the revamping of our texture line. Comparing 1972 with 1971, texture sales were up 16% and profits up 660%. A less expensive binder for joint system at Acme was thoroughly tested, proven and adopted late last year. Projected savings are $33,000 annually.

There are more cost savings investigations in the works for next year. A Ready Mix formula currently being field tested has a potential annual savings of $130,000. A water repellent size for wallboard paper was initiated in Tigard and is in the preliminary stages of plant evaluation. The potential advantages for this paper bond liner treatment are reduced starch usage, increased machine speed, improved quality. The savings should be enormous. Two continuing projects in joint system are (1) the search for a casein replacement, and (2) the elimination of asbestos fiber. We had a bad experience with our first effort to find a substitute for casein, so we are looking at some other possibilities. We are making progress toward the elimination of asbestos from all the joint system and texture formulas, but it is a tedious process.

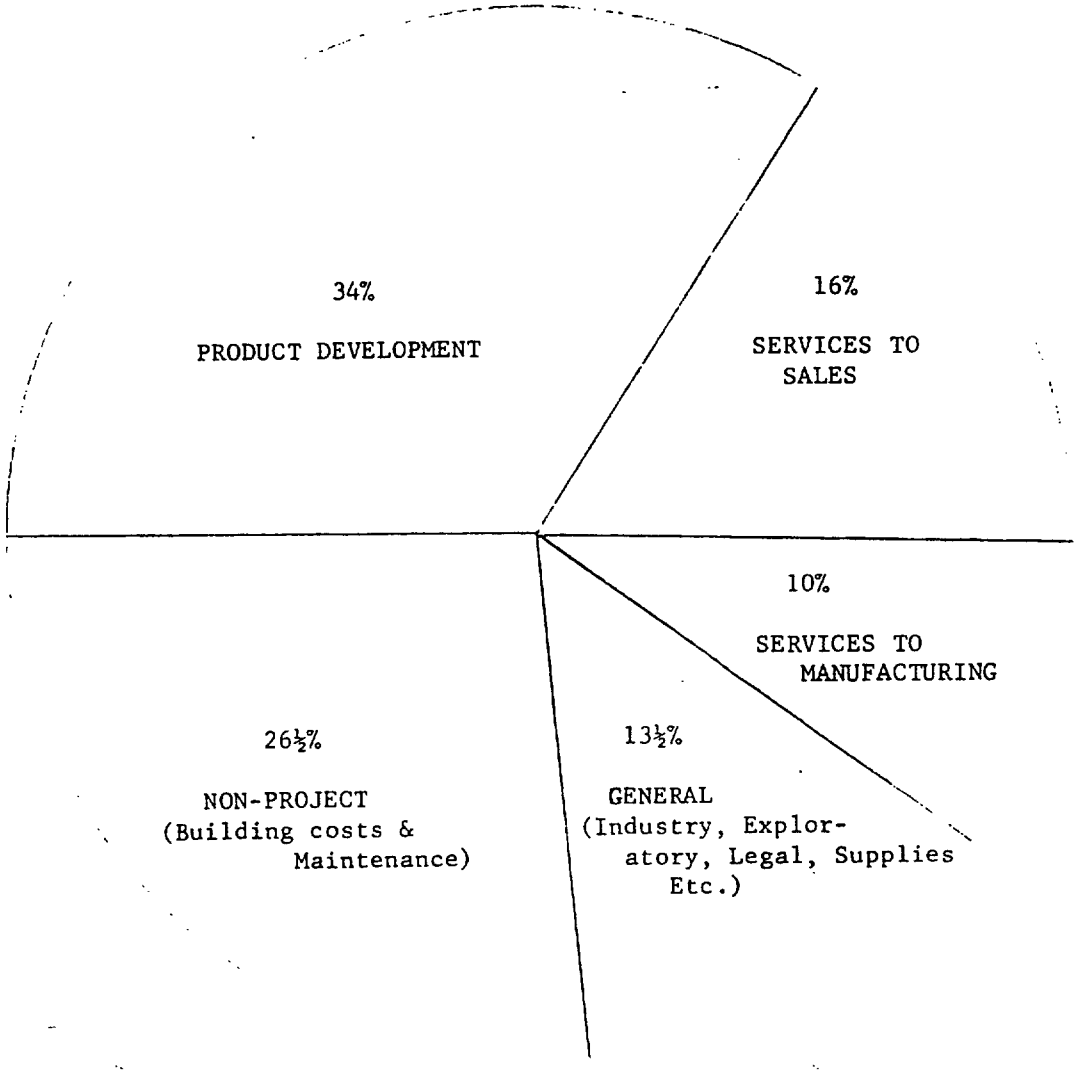
A few investigations, such as development of drywall and panel adhesive, will be phased out. The Firedoor project was revived when one of our Manufacturing people came up with a new idea. We are searching for a way to use molding plaster in products where Denscal or Densite are now required. Our Firestop licensing program will be reassessed since our basic patent expires in May of 1973. Fire and sound testing expenses will be diminished if we can persuade the Gypsum Association to do more testing.

SIX MONTH ANALYSIS OF SALES AND PROFITS FROM NEW PRODUCTS

UNIT	PRODUCT	Sales Volume	List Sales Amount	Gross Profit Amount
MSF	Radiant Heat Panels (All)	38	$ 14,617	$(9)
MSF	1/4" Sound Deadening Board	4,171	150,986	42,548
MSF	Pre-Dec Wallboard (All)	23,411	1,409,342	335,654
Tubes	Drywall Adhesive (Akron)	41,616	22,531	(494)
MSF	Shaft Liner Panels	34	7,105	2,464
MLF	Metal T Splines	38	6,502	1,537
MLF	Metal L Runners & J Channels	19	1,767	904
Tons	Ram Process Plaster	55	5,453	2,999
Bags	Polystyrene Texture	1,612	4,602	455
Bags	SRA Bedding Compound	17,048	30,205	7,652
Bags	SRA Topping Compound	84,133	138,555	42,634
			$1,791,665	$ 436,344

1972 ANALYSIS OF SALES AND PROFITS FROM NEW PRODUCTS

UNIT	PRODUCT	Sales Volume	List Sales Amount	Gross Profit Amount
MSF	Radiant Heat Panels	82	$ 32,062	$(602)
MSF	1/4" Sound Deadening Board	7,652	280,226	78,544
MSF	Pre-Dec Wallboard (All)	40,962	2,387,916	581,491
Tubes	Drywall Adhesive	48,492	26,545	(591)
MSF	Shaft Liner Panels	51	10,514	3,550
MLF	Metal T Splines	38	6,502	1,537
MLF	Metal L Runners & J Channels	19	1,767	904
Tons	Ram Process Plaster	98	9,529	4,919
Bags	SRA Bedding	17,048	30,205	7,652
Bags	SRA Topping	84,133	138,555	42,634
			$2,923,821	$ 720,038


34%
PRODUCT DEVELOPMENT
16%
SERVICES TO SALES
10%
SERVICES TO MANUFACTURING
13½%
GENERAL (Industry, Exploratory, Legal, Supplies Etc.)
26½%
NON-PROJECT (Building costs & Maintenance)

PRODUCT DEVELOPMENT SECTION

PRODUCT DEVELOPMENT

1. Drywall and Panel Adhesive

During the past six months, the Akron plant sold 40,000 tubes of drywall adhesive. An additional 45,000 tubes of drywall adhesive and 13,000 tubes of panel adhesive were sold by Tigard. Repeat orders of both products indicate that we had satisfactory market acceptance. It has been decided, however, that we will not manufacture adhesives and the project will be abandoned. We will sell the remaining adhesive in Tigard and Akron will manufacture a little more adhesive in order to deplete their supply of raw materials.

2. Non-Rosette Pre-Dec

Two possibilities for installing Pre-Dec without rosettes were developed and presented for consideration. One method involved a reverse foil back Pre-Dec with the foil serving as the vapor barrier. The other method consisted of using gypsum strips over the conventional polyethylene vapor barrier and laminating the Pre-Dec to the strips. These systems were judged to be too expensive by marketing and it was decided to discontinue this project.

3. Textures

Over a year ago, we set out to develop a new family of textures which would be more acceptable and more economical. The increase in the price of casein resulted in sharply diminished profits for our entire line of textures. Another objective was added when asbestos, an ingredient in our textures, was classified as a hazardous material.

We responded by developing new formulas without asbestos for all of the ceiling textures. A new product with polystyrene aggregate still contains a small amount of asbestos. The non-aggregated wall texture has presented a major problem because it must be so versatile. Several unsuccessful field trials of wall texture have been held. Very shortly another formula will be field tested which we expect to be successful. If so, it will bring this project very close to completion and we would expect to see dramatic increases in our texture sales and profits for 1973.

4. Joint System Formulations

For a number of years, our efforts centered around using fine gypsum instead of limestone as the filler at Acme. In the past six months, we have been more concerned with the high cost of casein at the other

plants and with the new safety standards relating to the use of asbestos fiber. With this in mind, our emphasis on joint system formulations has been as follows:

a) Casein Replacement--We developed formulas containing a polyacrylamide adhesive supplied by Dow Chemical Company. The products were called SRA (synthetic resin adhesive) and initial field tests and market results were favorable. However, these products encourage the use of more water than is desirable, which results in high shrinkage and indequate bonding. This was complicated by other factors causing serious field problems. It is questionable whether a satisfactory formula can be made using the Dow adhesive. In any event, most of our present efforts are being generated to handle the problems created by the SRA joint compounds.

b) Asbestos Replacement--A new All Purpose formula without asbestos is being field tested in the market serviced by Acme. An additional advantage is that the elimination of the asbestos has lowered the adhesive requirement resulting in a substantial lowering of the raw material costs. The reports from our field tests have all been favorable, so the scope of the field evaluation is gradually being increased.

At the same time, we are investigating the possibilities for eliminating asbestos in Ready Mix. This work has not progressed as far as the elimination of asbestos in the dry joint system and texture products.

c) Ready Mix Formulas--Two major Ready Mix investigations are underway. The first is the evaluation of a new thickener which would save at least $130,000 annually if it proves to be satisfactory. The second is a request from sales to impart easier sanding characteristics to Acme's Ready Mix. Trials of the new thickener are scheduled in the areas serviced by Chicago and Marietta. The sanding problem at Acme will necessitate some major changes, but it is receiving prompt attention because it is inhibiting the sale of Acme's Ready Mix.

d) Speed Set--An investigation is underway to improve the setting time characteristics of our Speed Set. The objective is to shorten the time between the initial stiffening and the final set. This will provide more working time to the user, and therefore, make the product more acceptable. The market for setting type joint compounds is increasing rapidly, and we are probable not getting our share of this business. In addition to the formula improvements, Manufacturing is considering whether to make Speed Set available at Blue Rapids in order to improve the cost and distribution.

5. Gypsum Paneling

Our Kalamazoo division stated that they can furnish a wood grain paper with a very durable finish for $12/M sq. ft. We have also requested that this paper be pre-striped so that we do not have to do the striping in our operation. There may be problems in aligning the edge stripes as we laminate, but we will just have to try it and see. Kalamazoo expects to have some paper for us to try shortly after the first of the year. The objective is to produce a gypsum-board panel that will compete with XKE and other inexpensive wood grain panels.

6. Firedoor Filler

A new approach to Firedoor filler material is a process found by our Manufacturing people. The process consists of mixing gypsum with perlite and other minor ingredients. A small amount of water is added to this mixture which is then compressed to the desired density. The resultant product is much stronger and waterproof than the previous compositions we were working with. It is planned to make some small-scale fire tests to see whether the product will provide sufficient resistance to the fire and hose stream exposure to make 1- and 1½-hour rated doors.

MARKETING SERVICES SECTION

MARKETING SERVICES

1. Shaft Wall System

The fire, sound, and structural tests were completed on the cavity type version of our shaft wall system. We now have versatility and substantiating test data that will satisfy most requirements.

2. Fire Ratings for 24" Center Wood Framing

We anticipate the necessity to develop fire ratings on 24" o.c. wood stud and joist spacing because of FHA approval. We conducted exploratory tests at Ohio State University in order to determine what problems we might have in getting the rating at Underwriters'. In addition to the wider spacing, the wood framing members have been reduced in size since our original ratings were achieved. We chose not to go directly to U.L. since an unsuccessful test could be detrimental to several current designs. The Ohio State tests showed that we would have to be very selective in quality of studs and use an extra heavy board in order to have a successful test. In view of this, we have decided to postpone any testing at U.L. until it is absolutely necessary.

We became aware of a test planned by the American Plywood Association for their glued floor system with 24" joists spacing and U.S.G.'s Type C Firecode wallboard. Through our management, we muscled into this test which will be conducted shortly after the first of the year using our Type XXX 5/8" Firestop. We made some construction and loading recommendations to APA which should help the chances for success. The important thing is that we will have the rating if the test is successful. We would have been excluded had we not intervened.

3. Shear Test for Pre-Dec

Sales has asked us to conduct an Underwriters' supervised series of shear tests of 12' x 28' mobile home roof sections with Pre-Dec. The shear rating or value to be obtained is necessary to comply with new code requirements for mobile homes which will go into effect in April of 1973.

4. Firestop for TRW Industries

TRW Industries plans to build a large number of living units using a pre-fab panel consisting of a honeycomb core and fire rated gypsum-board facings. In working with TRW, our Sales people found that TRW would not arbitrarily approve our fire rated wallboard unless we could prove that it was equivalent to or better than U.S.G.'s Fire-code C. After a number of discussions with the TRW people, it was necessary to conduct some pilot tests at Tigard which they witnessed. After the tests, they were convinced that our Firestop would be satisfactory for use in their system.

5. U.L. Listing for G-P Products in Canada

Since there is no reciprocal agreement between Underwriters in the United States and Underwriters in Canada, we had to formally apply for the Canadian U.L. listing. This became necessary when we began to market fire rated wallboard in Canada.

6. General

a) Westroc and Domtar have asked us to test the Hambro floor and ceiling construction which is used extensively in Canada. As a result of their desire to restrict the use of this test, we must be careful what kind of assistance we provide. The reason is that our other licenses require us to furnish data as it becomes available. We will not participate in the Hambro test and have suggested that Westroc and Domtar sponsor the test themselves. We will offer technical assistance, but on a fee basis only.

b) Sales has asked us to get a one-hour rating for a metal stud partition with 1/2" Firestop on each side. U.S.G. and National have this rating using mineral wool in the cavity. We find that Westroc, one of our licensees, has achieved this rating using Fiber-glas in the cavity, so we may offer to purchase the test from them after studying the formal report and reviewing the construction details. This would be much cheaper and easier as long as it will satisfy the marketing needs.

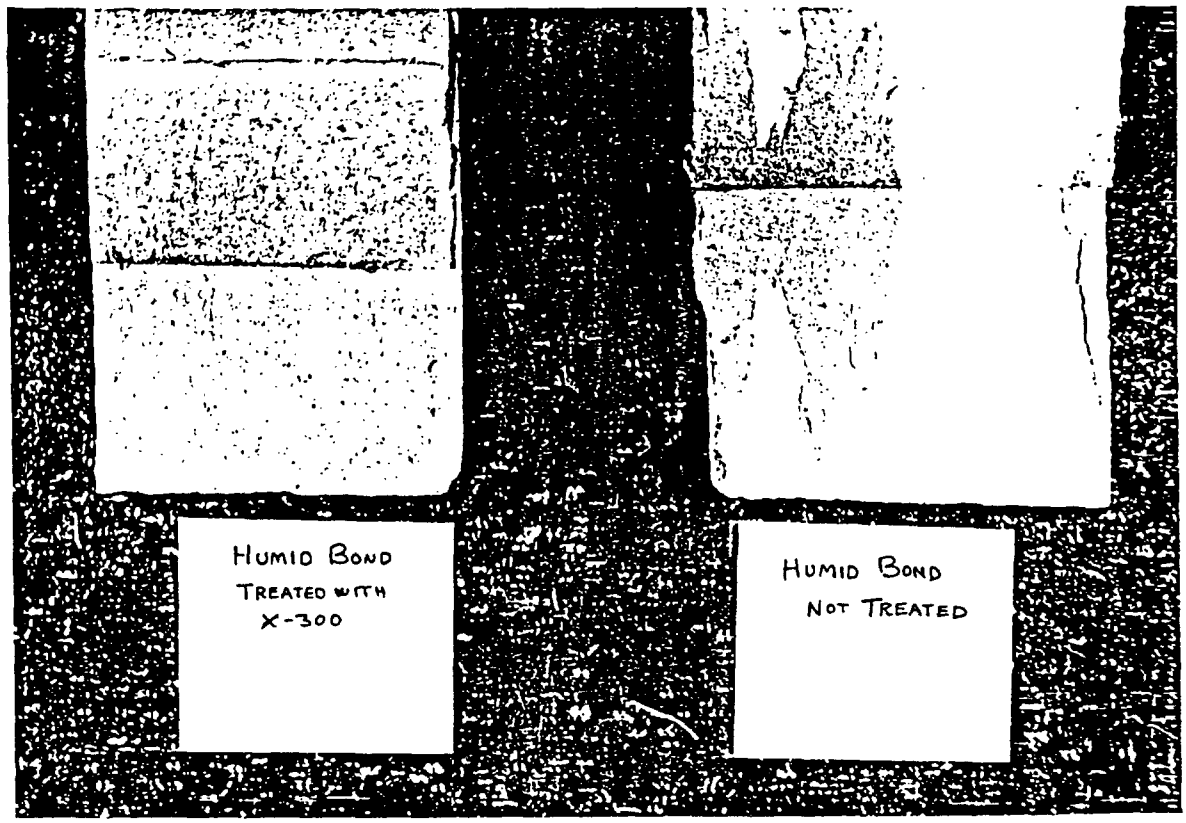
c) We helped Truline Truss, a local corporation, get ICBO approval for a construction consisting of their wood trusses 4' o.c., furring channels 24" o.c., and our 5/8" XXX Firestop.

MANUFACTURING SERVICES SECTION

MANUFACTURING SERVICES

1. Water Repellent Sizing for Wallboard Paper

Michelman Chemical Company of Cincinnati, Ohio, sent us a sample of X-300 polyethylene emulsion to evaluate as a vapor barrier. They stated that U.S.G. had purchased some rather large quantities for experimentation. The X-300 turned out to be a good water repellent, but not a very good vapor barrier. National Gypsum Company has a patent on the use of silicone water repellent and we wondered whether the polyethylene emulsion would function in the same manner as the silicone. Some small-scale tests were made in Tigard followed by two short plant runs at Akron and Grand Rapids. A set of three rolls of greyback paper was treated with X-300 at Thorold and this paper was used in the plant trials. During these experimental runs, the starch was reduced by 40-50% and in each case excellent dry and humid bonds resulted. The face paper which was untreated did not bond as well as the back paper in either case, and at Grand Rapids the face bond was very poor (see picture below).



Additional trials of longer duration will be conducted at Akron and Grand Rapids so a better assessment of the advantages should be possible after those runs. The anticipated advantages, in addition to reduced starch usage, are increases in machine speed and improvement in operation efficiency.

2. By-Product Gypsum

DuPont Company has sent us some small samples of by-product gypsum they will have in their Richmond, Virginia, plant which will go on-stream in 1976. This is a long time off, but DuPont wants to try to find some use for the gypsum to overcome the problem they will have in disposing of it. From the samples tested, we have determined that the by-product gypsum will be high in purity, very white, and free of contaminants. We are continuing to keep abreast of waste gypsum in the event that one comes along which is economical to use.

3. Pre-Dec

Manufacturing requested our assistance in planning an early start-up for the Fort Dodge Pre-Dec operation. We also prepared and distributed a complete quality control procedure for Pre-Dec which will help prevent future problems if it is followed.

4. Joint System

We have provided assistance in planning and ordering of equipment for the Milford Ready Mix plant. Mr. C. B. Hilton was recruited and trained here and will become the quality control supervisor at Milford.

5. Gypsum Analyses

We have reduced the analysis procedure to those deposits where the purity is marginal or where the plant specifically requests that an analysis be made. Some plants have had to increase their calcining capacity to keep up with the wallboard requirements. We suggested that kettle samples be submitted in these cases to be sure the stucco was not over or under calcined. We formerly hired a part time analytical chemist to conduct the analyses two or three days each week. We now analyze only one day each week. Instead of hiring a part time analyst, Mrs. Elaine Zulauf was trained to handle this in addition to her secretarial responsibilities.

6. General

a) A new stabilizer system for plaster products was tested and has been substituted for the stabilizer block we formerly manufactured and used for this purpose. This became necessary when the wallboard plants discontinued the use of block for wallboard accelerator.

b) Several new raw material candidates for joint system were tested and reported on.

PATENTS & LICENSING SECTION

PATENTS & LICENSING

The Firestop royalties for 1973 totaled $306,499.54. The patent and licensing matters we are currently involved with are as follow:

1. Firestop

Georgia-Pacific's U.S. patent on the basic glass fiber/raw vermiculite Firestop formula will expire on May 1, 1973. Our basic Canadian Firestop patent will remain in effect for two more years. The clay addition patent is only a year old, so it has a long time to run. The clay addition patent covers all of our 1/2" Firestop and the 5/8" XXX Firestop. We have offered licenses under the clay addition patent, but so far no one has signed up. There are eight U.S. licensees who have depended upon G-P and predecessor companies for all their fire ratings, formula improvements, and code approvals, and other information relating to fire rated gypsum products. As the time draws close to May 1, it will be interesting to see whether they decide to continue as a licensee under the clay addition patent or go it alone.

2. Shaft Wall

Domtar, Westroc, and Celotex have taken license agreements on our shaft wall system. So far we have not received any shaft wall royalties, so perhaps the gypsum shaft wall business in not growing as fast as we thought it would. However, sales of products in high-rise buildings are often slow to materialize, so it may be premature to make a judgment at this time.

We have had two actions from the patent examiner on our shaft wall patent application - both were rejections. We are preparing a response now to counter the latest rejection of our claims. The patent examiner does not have a good basis for rejection, and we believe that some slight revisions in our claims will convince him to allow them. If so, we should have a patent issue early next year.

3. Round Edge Wallboard

We responded to a rejection from the examiner about six months ago and believe some persuasive arguments were presented. We should hear from the examiner soon and this action should be decisive in whether we get a patent or not.

INDUSTRY REPRESENTATION SECTION

INDUSTRY REPRESENTATION

Members of our department represent Georgia-Pacific on several industry committees. These are the Materials Handling and Technical Committee of the Gypsum Association and ASTM C-11 on gypsum and ASTM E-5 on fire testing. The purpose of our participation in these groups is to keep current with the changes which are taking place in the industry; to protect G-P's interest in the development of standards, specifications, or procedures; and to conduct tests or programs less expensively through an industry association than we could as an individual company.

For instance, I am sure we have more clout in dealing with the railroads as an industry than we would have as an individual company. Methods of car loading and other similar subjects are considered by the Materials Handling Committee. In the Technical Committee, we are proposing that the Gypsum Association undertake the majority of the fire and sound tests that are required by the industry. There is a lot of duplicate testing that could be eliminated if we can work out the mechanics for an industry testing program.

There are several standards in ASTM which are important. Examples are the new performance standards for gypsum wallboard, a method for distinguishing regular and Type X wallboard, and specifications for predecorated gypsumboards.